

We claim:

1. A deposition target source for ion deposition of a material onto a substrate, comprising an inner insert having at least one mating surface; a separate outer region at least substantially surrounding the inner insert and having a surface detachably mating with the mating surface of the inner insert; and an interlocking interface formed by the mating surfaces of the inner insert and the outer region to form the deposition target source and to enable detachment of the inner insert for replacement after ion deposition.

2. A target source according to Claim 1, wherein the interlocking interface comprises a mechanical interlocking lip structure to prevent contaminants from passing between the mating surfaces of the inner insert and outer region.

3. A target source according to Claim 3, wherein the mechanical interlocking lip structure is formed substantially as shown in Figs. 1-4.

4. A target source according to Claim 3, wherein the mechanical interlocking lip structure is formed substantially as shown in Fig. 5.

5. A target source according to Claim 3, wherein the mechanical interlocking lip structure is formed substantially as shown in Fig. 6.

6. A target source according to Claim 1, wherein the inner insert and the outer region each define a rear surface, and further comprising a backing plate affixed to the rear surfaces of the inner insert and outer region.

7. A target source according to Claim 1, and further comprising a bonding layer of solder to affix the backing plate.

8. A method of reusing an eroded deposition target source used for ion deposition of a material from the target source, comprising the steps of:

5 (a) forming the target source in at least two separate parts made of the same deposition material and comprising an insert, from which the material is to be used for deposition, and an outer part at least substantially surrounding the insert by an interface to prevent contaminants from passing between the parts;

10 (b) affixing both parts to a backing plate for insertion into an ion beam deposition machine for deposition of material substantially from the insert onto a substrate, thereby eroding the insert;

(c) removing from the ion beam deposition machine at least the insert after deposition and replacing it in the ion beam deposition machine with a new uneroded insert for further deposition using material from the new uneroded insert.

15 9. The method according to Claim 8 in which both target parts are affixed to a backing plate to form an assembly, and comprising the step of removing the assembly after deposition, detaching at least the eroded insert from the backing plate, and replacing the eroded insert by affixing the new uneroded insert to the backing place and reusing the outer part and the new uneroded insert for further deposition in the ion beam deposition machine.

20 10. The method according to Claim 9 wherein both target parts are affixed to the backing plate by a layer of solder, and the eroded insert is removed by heating the layer of solder.